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ABSTRACT

A need to provide more data about the impact of schools on children in terms of manipulable variables prompted an examination of the relationship between school organization and student aspirations for further education. A causal model is examined which would enable investigation of the mechanism by which school contexts could alter aspiration. Data was collected from 17 tenth grade classes in Ontario. Variables measured by questionnaires are summarized for success, social class, type of program, aspiration for further education, bureaucratization, and alienation. A series of regression models ascertained the effect of schools and school bureaucratization on student aspiration levels. A causal model arrived at through path analysis showed the direction of causal influence felt to operate, reduce or raise the aspiration levels of students. Tentative conclusions state that the impact of differences between schools on educational aspirations is very small once the influence of individual characteristics have been partialled out. Path analysis was felt to offer a useful means of getting at the effect of school variables. The conclusion suggests research in the area of the effects of school environments by studying patterns of interaction between variables. Tables and references are included. (Author/KSM)

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SOCIAL CLASS, SCHOOL BUREAUCRATIZATION AND EDUCATIONAL ASPIRATIONS

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of

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Social Class, School Bureaucratization and Educational Aspirations

Despite the fact that the United States commits about 7% of its gross national product to public education, little is known about the impact of schools on children. Those studies which have attempted to examine this seem to show that the variance of variables such as achievement and aspirations is much greater within schools than between them, especially when individual background characteristics of students such as sex, intelligence and social class are held constant.[1] These findings, taken in sum, raise very serious doubts about whether or not schools have any major impact on their students--a point which has most recently been raised by Hauser (1970), but which also appears as a central theme in Stephens' book, The Process of Schooling (1967).

Perhaps reflecting a dim awareness of this evidence, many researchers have sought explanations for student achievement and attitudes outside the school--in their social class, intelligence, and sex. In terms of their magnitude, these explanations are much more satisfactory as predictors of student outcomes than school-related variables but they use variables which are difficult to manipulate and therefore often do not indicate possible directions for policy development and action.

From the standpoint of people who must develop and implement policy with respect to the operation of schools, research is needed into the mechanisms by which schools can determine student outputs. This research needs to be conducted in such a way as to indicate the amount of variance in the output measures which

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[1]There is no dearth of such studies. Interested readers are referred to Sewell, Haller and Straus (1957); Wilson (1959, 1967); Astin (1963); Greenfield (1963); Coleman et al. (1966); Sewell and Armer (1966); McDill, Rigsby and Meyers (1969); Hauser (1970); Meyer (1970); the collection of studies in Mood (1970); studies summarized by Feldman (1971); and Williams (1971).

can be accounted for by differences between schools (in other words to try and set limits on school effects). This done, research should attempt to provide some information about the causal mechanism by which schools influence an output variable.

Because we felt a need to provide more data about the impact of schools on children in terms of manipulable variables, we attempted an examination of the relationship between school organization and student aspirations for further education. Our purpose is not to provide a complete explanation of aspiration level in terms of sociological theory but rather to investigate a much more pragmatic question: "Is there a relationship between the manner in which schools are run and the educational aspirations of students?"

There is a good deal of literature relating to educational aspirations and expectations, with more appearing constantly. This literature may be broken down into two broad categories: attempts to examine the influence of variables unique to the child (such as his intelligence, social class, parental expectations and so forth), and attempts to use variables which indicate something about the social milieu in which the child lives. Naturally, there are a number of studies which interfere with this taxonomy by considering both types of variables simultaneously, but the classification of variables remains a useful way of organizing the large number of studies which have been reported.

In terms of the personal variables, a review of the evidence by Williams (1971) led him to the conclusion that socio-economic status and intelligence provided large and separate influences in determining plans for further education. Williams, like others before him, also found that the expectations of parents, peers, and teachers seemed to have an influence on the plans of students.

In addition to these relationships, others have been found between the social context in which a student is located and his aspirations. Perhaps the best known contextual effects study is Equality of Educational Opportunity (Coleman et al., 1966), but there have been several others. In general, these studies indicate that there is a small degree of association between school context and student aspiration level, but they do not give a very good idea of the causal mechanism by which the context of the school alters aspirations.

The purpose of this study then is twofold: we wish first to present a means of examining data which other researchers may find useful as they attempt contextual effects studies. Second we attempt to examine a causal model which would enable investigation of the mechanism by which school contexts could alter aspirations. The second purpose is explicit in terms of the paper's format, the first is not, but we hope that readers will examine our process as well as our results.

The Sample

In order to test the model we used data collected as part of a study of alienation from the high school. The data had been collected in the 1967-68 school year in 18 high schools located in the province of Ontario, Canada.[2] The sample of schools was stratified to reflect the variety of academic programs offered in the province at that time. It was also stratified so that schools of different sizes and in both rural and urban centers would be represented. The subjects were 3,605 grade ten students--the entire grade ten population of the schools with the exception of absences.

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[2] For this study one of the schools was dropped from the sample. Its students were of very low intelligence, and it was a school intended to give only a very basic vocational education. There was a good deal of evidence to indicate that the students had been unable to understand our questionnaire and that they had provided invalid data.

Variables

The variables were all measured by means of questionnaires given to each student. The measures may be briefly summarized as follows:

Success: Since all students were in grade ten, age was used as a proxy for success, Older students would be those who had failed one or more years.

Social Class: Each student was asked to respond to two questions which sought details of his father's occupation (or his mother's if there was no father in the hame). The resulting descriptions were used to code the occupations into one of the seven broad categories of the Blishen Scale - an index of social class developed for use in Canada. (Blishen, 1965)

Type of Program: A single item on the student questionnaire allowed us to classify students in one of eight programs offered in Ontario:

Five year arts and sciences
Five year general
Five year business and commerce
Five year science, technology and trades
Four year academic
Four year commercial
Four year-other
One or two year program

Aspiration for Further Education: Students indicated one of four options:

Leave before completing high school
Complete high school and go to work
Complete high school and take a technical training course
Complete high school and go to university

Bureaucratization: This variable was measured by 34 Likert-type items which tapped five dimensions of bureaucratization as seen by students. The dimensions, operationally defined in terms of highly bureaucratic organizations are as follows:

(1) Hierarchy of Authority: A clearly defined system of super- and sub-ordination.

(2) Rules: A system of rules covering the rights and duties of members of the organization exists and is enforced.

(3) Procedural Specifications: A set of specifications which regulate how work is to be done.

(4) Impersonality: Relations between members of different hierarchial strata are formal and business-like.

(5) Technical Competence: Promotion and selection based upon competence and training.

(6) Specialization: A division of labor based upon functional specialization.

Factor analyses of the correlations between these dimensions suggested that they could be combined into two distinct factors. The first of these is Status Maintenance which refers to attempts on the part of school personnel to maintain social distance from students. The second referred to student's observation of rules and regulations in the school and is called Behavior Control.

The bureaucracy scale was originally constructed with the aid of factor analytic techniques, and some previous reports of the scale (Anderson, 1970, 1971) have used image scores as a basis for data analysis. However, unlike the earlier studies, this analysis is based on the sub-scale scores derived by adding together the scores for appropriate items. The appropriateness of any item for one or the other of the two factors of bureaucratization was determined by factor analyses reported earlier. In order to obtain measures of school levels of status maintenance and behavior control the scores of students within each school were summed and averaged.

Alienation: This variable was also measured by 38 Likert-type items. These measured five aspects of alienation mentioned by Seeman (1959), but with the proviso that alienation was measured with school as a focus rather than as a generalized feeling. The five dimensions, each defined in terms of an alienated student, are:

(1) Powerlessness: A low expectancy of ability to determine or control outcomes or reinforcements sought in the school.

(2) Meaninglessness: A low expectancy of ability to make satisfactory predictions about the future outcomes of behavior in the school.

(3) Misfeasance: An expectation that the use of means which are proscribed by school authorities is necessary in order to attain goals desired by the student.

(4) Futility: Assignment of low reward value to goals and beliefs that are (typically) highly valued by school authorities.

(5) Self-estrangement: Participation in school and school-related activities is based largely upon anticipation of future rewards, rather than upon rewards inherent to participation - such as pleasure or satisfaction.

Earlier factor analyses has shown these five dimensions to be correlated and so we felt it acceptable to use only one integrating factor of alienation as a basis for examing our model. It was obtained by summing responses to the 38 item questionnaire.

Data Analyses

We use two analyses to shed light on the research question. At first, we attempt to show how much of the variance in educational aspirations can be accounted for by differences of any sort between schools. We then attempt to show how much of this between schools variance can be accounted for by differences in the manner in which those schools are run. Specifically, we hope to be able to account for the between schools variance in aspiration levels in terms of the degree to which schools are bureaucratically organized.

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TABLE I
N=3605
MEANS, STANDARD DEVIATIONS AND CORRELATIONS

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1. Age																											
2. Sex (Females=1)	-10																										
3. Type of Program	25	-05																									
4. Aspiration Level	-20	-10	-62																								
5. Socioeconomic Status	26	-11	31	-26																							
6. Aspirations from School	-10	14	-11	27	02																						
7. Perceived Status Maintenance	-06	01	-19	17	-10	29																					
8. Perceived Behavior Control	04	-09	-04	-01	-11	-38	19																				
9. Actual Status Maintenance	-06	05	-28	20	-22	03	21	16																			
10. School Behavior Control	-01	02	-26	20	-33	-16	13	3.	57																		
11. School 1	-01	03	-06	-02	06	07	-00	-06	-01	-19																	
12. School 2	00	01	14	-07	11	07	00	-08	05	-21	-04																
13. School 3	09	-11	23	-10	11	02	-09	-05	-13	-12	-05	-07															
14. School 4	06	-01	23	-17	10	06	-02	-08	-04	-25	-04	-05	-07														
15. School 5	-03	02	-05	-05	05	00	-04	-06	-15	-17	-03	-04	-05	-04													
16. School 6	03	14	08	-13	10	01	-03	-06	-12	-15	-03	-04	-05	-04	-03												
17. School 7	-09	06	-15	14	02	11	-01	-12	-02	-38	-05	-06	-08	-06	-05	-05											
18. School 8	01	02	-05	02	-03	-06	-01	05	-05	18	-04	-05	-07	-05	-04	-04	-06										
19. School 9	-04	05	-08	01	-01	-07	00	02	01	06	-04	-05	-06	-05	-04	-04	-06	-05									
20. School 10	-11	-01	06	-03	11	03	-07	-07	-29	-21	-05	-06	-08	-06	-05	-05	-08	-06	-06								
21. School 11	10	-06	28	-14	09	-04	-01	01	-07	01	-03	-04	-05	-04	-03	-03	-05	-04	-04	-05							
22. School 12	-03	-02	05	-04	05	-01	01	-02	03	-03	-05	-07	-09	-07	-05	-05	-08	-07	-06	-08	-05						
23. School 13	04	-04	10	-11	08	-01	-07	-07	-28	-21	-04	-05	-06	-05	-04	-04	-06	-05	-05	-06	-04	-07					
24. School 14	-04	05	-10	05	-17	-06	05	16	14	46	-06	-08	-10	-08	-06	-06	-09	-08	-08	-10	-06	-10	-08				
25. School 15	01	-01	-18	13	-12	05	19	10	78	27	-06	-08	-10	-08	-06	-06	-03	-08	-07	-10	-06	-10	-07	-12			
26. School 16	-03	01	-14	11	-16	-06	-00	09	-05	28	-04	-06	-07	-05	-04	-04	-07	-06	-05	-07	-04	-07	-05	-08	-08		
27. School 17	-01	00	-18	13	-20	-10	01	11	08	32	-05	-07	-08	-07	-05	-05	-08	-07	-06	-08	-05	-09	-06	-10	-10	-07	
Means	15.54	.52	3.56	3.11	4.09	133.73	31.59	54.34	31.50	54.51	.03	.05	.08	.05	.03	.03	.07	.05	.05	.07	.03	.08	.05	.11	.10	.05	.08
Standard Deviations	1.95	.50	2.02	.96	1.88	22.67	5.35	11.60	1.29	3.93	.16	.22	.27	.22	.17	.18	.25	.22	.21	.26	.16	.27	.21	.31	.30	.23	.27

First, we ran a series of regression models to ascertain the effect of schools and school bureaucratization on student aspiration levels. Five models are needed for this analysis:

1. Aspiration ← f(school variables + control variables)[3,4]
2. Aspiration ← f(status maintenance + behavior control + control variables)
3. Aspiration ← f(control variables)
4. Aspiration ← f(status maintenance + behavior control)
5. Aspiration ← f(school variables)

Table II shows the results of these analyses. As can be seen from the table, model (1) explains a substantial 47.7% of the variance in aspiration level. Comparing model (1) with model (3) shows that only 1.9% of the variance in aspirations can be attributed to the effect of differences between schools over and above the effects of control variables. Comparing model (1) with model (5) shows that 33.2% of the variance is attributable to the effect of control variables over and above the effect of differences between schools. Thus, 12.6% of the variance in aspiration is attributable to overlap between schools and control variables (see Table III).

How well does bureaucratization serve to explain the differences between schools? By repeating the analysis reported using measures of bureaucratization in place of the dummy variables for each school we found that status maintenance

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[3]The controls are: age, sex, type of program, socio-economic status, and alienation from school.

The variables we call "school variables" are a series of 17 binary (or dummy) variables such that the first binary variable is one if the student is in school one, zero otherwise; the second is one if the student is in school two, zero otherwise; and so forth. These variables will account for all differences between schools, regardless of their nature. Specifying the nature of the differences (for example by inserting measures of bureaucratization in place of the binary variables) will reduce the variance explained by the model to the extent that the replacement measures are not indicative of the differences between schools in terms of the dependent variable.

TABLE II

REGRESSION MODELS PREDICTING LEVEL OF ASPIRATION

	MODEL NUMBER				
Variables	**1**	**2**	**3**	**4**	**5**
1. age	-.03	-.03	-.03		
2. Sex (Females=1)	-.30	-.32	-.31		
3. Type of Program	-.21	-.20	-.21		
5. Socio-economic status	-.03	-.04	-.05		
6. Alienation	.01	.01	.01		
7. Perceived Status Maintenance	.00	.00	.00		
8. Perceived Behavior Control	.00	.00	.00		
9. School Status Maintenance		-.02		.10	
10. School Behavior Control		.02		.03	
11. School 1	-.38				.09
12. School 2	.00				-.10
13. " 3	.05				-.15
14. " 4	-.04				-.32
15. " 5	-.43				-.07
16. " 6	-.32				-.50
17. " 7	.13				.70
18. " 8	.00				.26
19. " 9	-.07				.26
20. " 10	-.03				.07
21. " 11	.15				-.63
22. " 12	-.04				.07
23. " 13	-.24				-.28
24. " 14	.08				.41
25. " 15	.00				.55
26. " 16	.11				.63
27. " 17	-.03				.61
Constant	3.18	2.38	3.14	-1.68	2.92
Squared Multiple Correlation	.477	.463	.458	.053	.145

TABLE III

PARTITIONING OF VARIANCE IN LEVEL OF ASPIRATION INTO SCHOOL AND BACKGROUND-RELATED SOURCES[1]

Total variance explained (model(1))		47.7%
Part unique to schools (model (1) - model (3))	1.9%[2]	
Part unique to controls (model (1) - model (5))	33.2%[2]	
Overlap between schools and controls (47.7% - (1.9% + 33.2%))	12.6%	
	47.7%	

TABLE IV

PARTITIONING OF VARIANCE OIN LEVEL OF ASPIRATION INTO SCHOOL BUREAUCRATIZATION AND BACKGROUND-RELATED SOURCES[1]

Total variance explained (model (2))		46.3%
Part unique to school bureaucratization (model (2) - model (3))	.5%[2]	
Part unique to controls (model (2) - model (5))	31.8%	
Overlap between school bureaucratization and controls (46.3% - (.5% + 31.8%))	14.0%	
	46.3%	

1. The variance partitioning procedure is from Mood (1971)
2. Statistically significant ($p < .001$)

and behavior control accounted for only .5% of the variance in aspiration level over and above the effect of the controls (model (2) - model (3)). The controls account for 31.8% of the variance, leaving 14.0% attributable to overlap between bureaucratization and the controls (see Table IV).

Bureaucratization, then, explains only 26.3% (.5/1.9 x 100%) of the variance attributable to differences between schools over and above the effect of the control variables. However, neither bureaucratization nor the school effects themselves seem to account for a large amount of variance in aspiration level. At most, differences between schools account for only 14.5% of the variance in aspiration level (model (4)) and most of this (12.6%) is shared with the controls.

On the surface, then, there does not seem to be much relationship between schools and student aspirations for further education. There is some however, and in fact the overlap between school characteristics and the background variables is large enough to warrant further investigation. In order to explore this relationship further we chose to use a technique known as path analysis.

Path analysis is a method which allows the exploration of relationships between variables when the researcher believes he is able to order them into a causal sequence.

As the purpose of path analysis is not so much to allow a rigorous test of theory as to provide insights into the suitability of various theoretical models, it is a useful way of looking at interactions between background variables and school characteristics. The technique aims to determine a set of path coefficients which indicate the impact of one variable on another. These are, in effect, standardized partial regression coefficients. Coefficients may be interpreted by noting that an increase of one standard deviation unit in

variable 'A' will cause an increase of one standard deviation in 'B' times the path coefficient linking 'A' and 'B'. Thus, large path coefficients indicate important causal links, small ones relatively unimportant links.

Because regression coefficients can be very unstable, varying greatly as variables are entered and deleted from the regression equation, a central problem in path analysis is to determine whether or not a given model is "good." Nygreen notes that most techniques for evaluating causal models fit one of three basic approaches:

1. Comparing one model with alternatives to see how well the model can be used to reproduce the empirical correlation matrix.
2. Deletion of empirically irrelevant paths. When a path coefficient is found to be unimportant, it may be deleted; but the deletion calls for a revision of the theory underlying the model. Further, there is no way to establish an objective criterion for what constitutes an unimportant path coefficient.
3. Attempts to decompose causal effects into direct and indirect components. This allows an appraisal of the importance of a variable through its indirect effects on an outcome. These are normally hard to detect in more usual analysis procedures.

Rather than spend a great deal of time elaborating the path analysis model we refer the reader to Nygreen (1971), whose article contains the relevant footnotes, sets forth the assumption and explains the path analysis procedure used in this data analysis. The strategy for evaluating our model is to delete small paths ($<.10$) on the grounds that only large paths need be considered given the crudeness of our data, and our goal of shedding a little light on the mechanism by which schools could alter educational aspirations of students.

The Causal Model

Since numerous contextual effects studies have shown small associations between school context and student aspirations, we assume that there is something about the context of a school that could cause changes in the aspiration levels of students. We further assume that the most interesting aspects of the context, from an administrative viewpoint, would include variables which could be manipulated so as to cause changes in students' aspirations levels. Using some aspects of prior research and working on those two assumptions we arrived at the model shown in Figure 1. That model shows the direction of causal influences which we felt could operate to reduce or raise the aspiration levels of students.

The figure shows the probably direction of causation linking a series of variables which have been suggested as sources of aspirations for further education. Variables on the left of the model are assumed to cause those on their right via the connections shown in the figure. Thus, social class is assumed to affect success in school and to affect the type of program in which students are enrolled. These, in turn, affect educational aspirations. At the same time, we felt that some of our prior research indicated that social class should also be associated with school bureaucratization and, through bureaucratization and alienation from school, with levels of aspiration. This reasoning is reflected in the lower part of the figure.

Figure 2 shows the results of our path analyses. As can be seen from the figure, some of the paths seemed to be trivial (they were less than .10) and so were deleted from the model. The model does account for a good-sized 42% of the variance in aspiration level, and it is clear that the majority of this seems to be due to the type of program in which the student is enrolled.

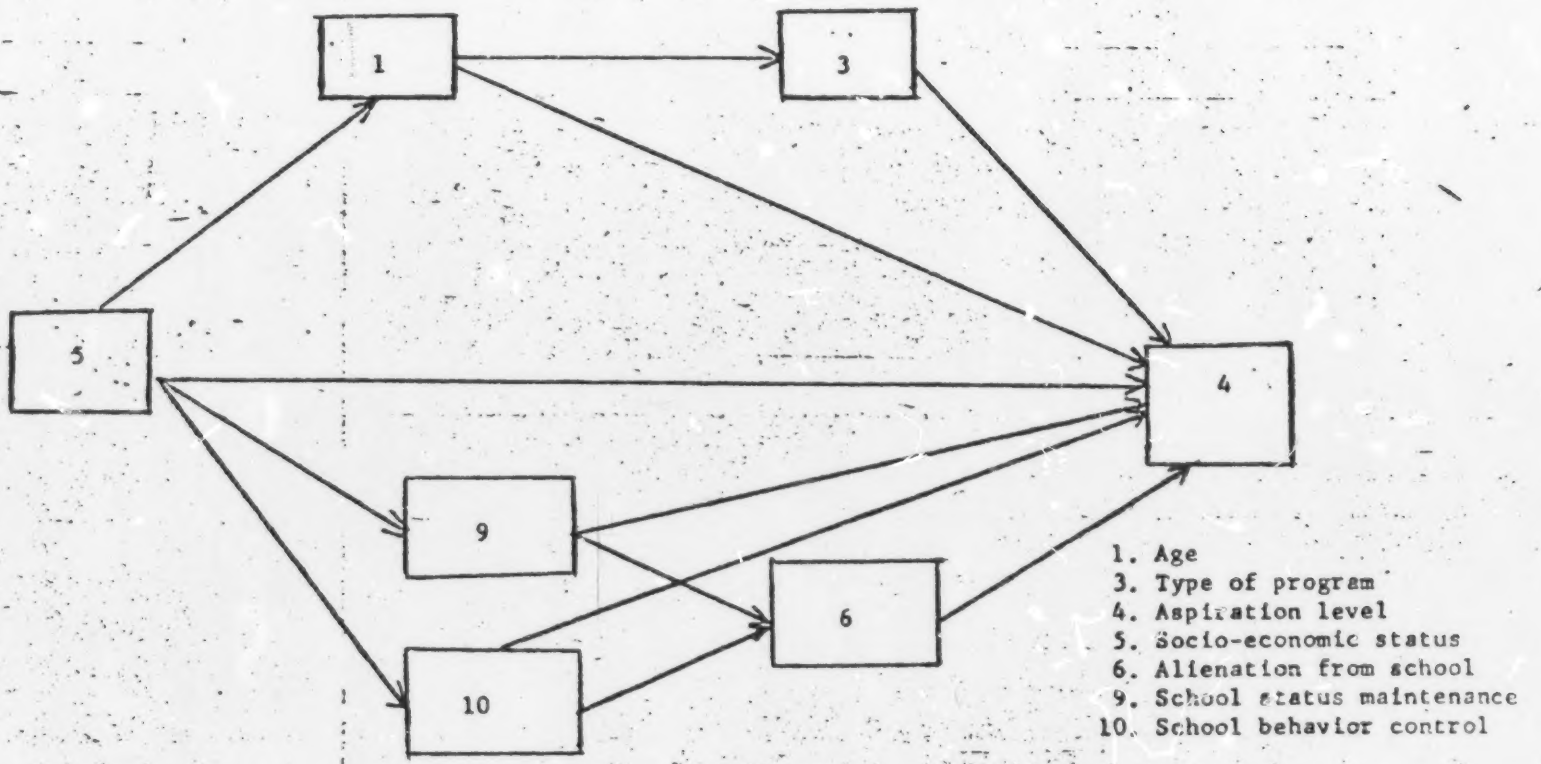

FIGURE 1

HYPOTHETICAL CAUSAL LINKS BEWTEEN SELECTED VARIABLES AND ASPIRATION LEVEL

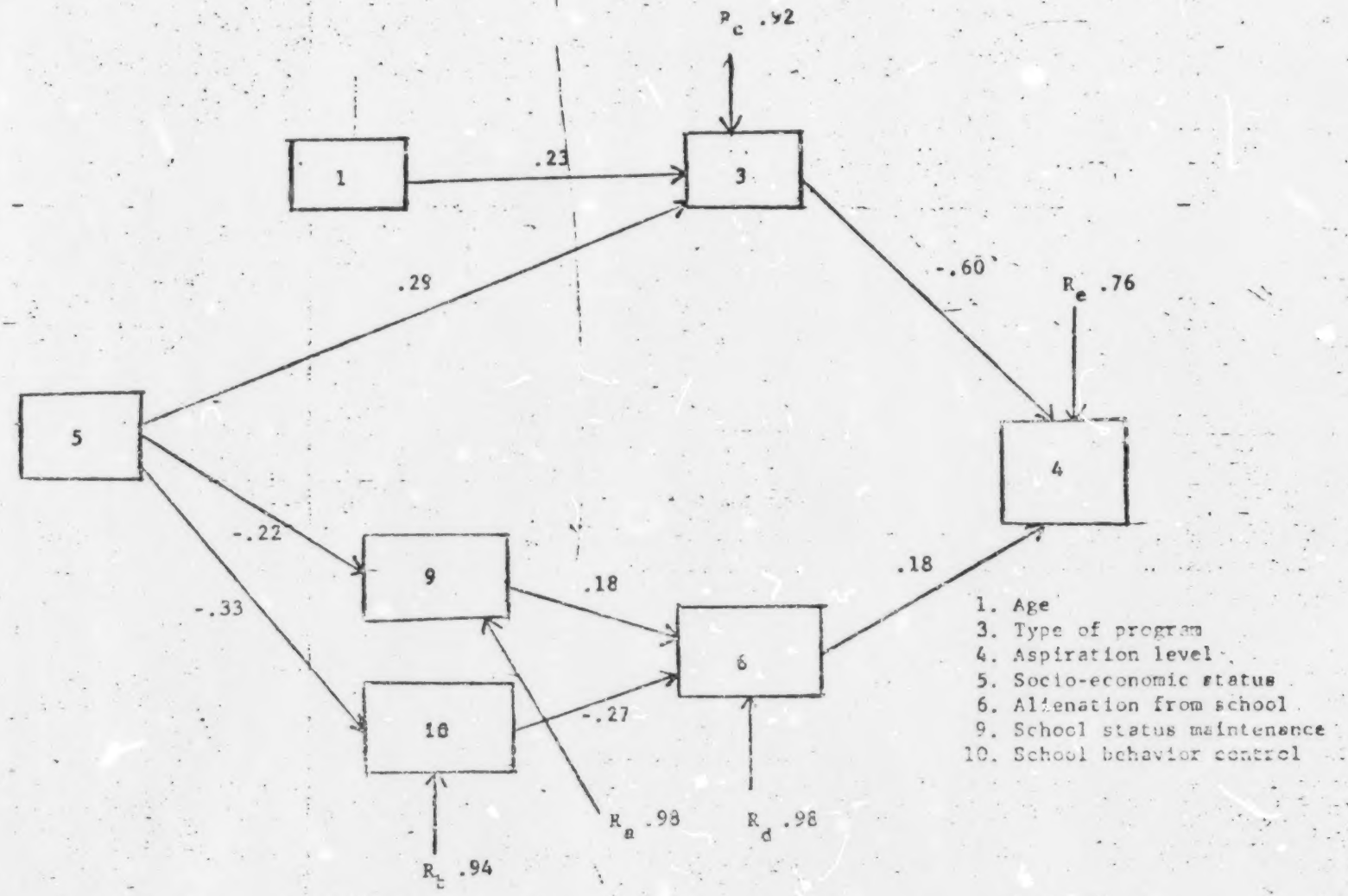

FIGURE 2

IMPORTANT PATH COEFFICIENTS LINKING THE VARIABLES

Clearly, a process of "cooking the mark out" seems to be in operation.[5]

The variables in which we were originally interested, bureaucratization and alienation from school, contribute to level of aspiration somewhat but their influence is much less than that of less elegant variables: type of past success, and socio-economic status. Furthermore, their contribution to aspiration is indirect.[6] The path analysis tells us that a good deal of the correlation between socio-economic status and level of aspiration is mediated through other variables. In this case the two most important mediating routes are through type of program to aspiration level and through measures of bureaucratization to alienation and finally to level of aspiration. Both routes are through school variables which could be manipulated by administrators and teachers, perhaps in such a way as to maintain realistic levels of aspiration in students. This is not to say that realistic levels are not presently maintained through these variables. One central problem in school administration seems to be that of getting children to lower their sights to more "realistic" goals.

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[5]The term is borrowed from Clark (1960) who uses it to refer to the process of teaching students to lower their aspirations.

[6]The indirect contribution of a variable in the model to the dependent variable is the correlation between the two variables less the path coefficient between them. For example, the correlation between socio-economic status and level of aspiration is -.26 and the path coefficient between the two variables is -.07. Thus, .19 remains to be accounted for as the indirect contribution of school status maintenance to level of aspiration. (For other examples see Feldman (1971).)

Conclusions

Because of the tentative nature of our data,[7] and because we are trying to indicate the possibilities of an approach to the problem of studying school effects, all but one of our conclusions are somewhat tentative. It is clear from these data, as well as from a good deal of other data, that the impact of differences between schools on educational aspirations (and on a good number of other variables as well) is very small once the influence of individual characteristics have been partialled out. Thus, the problem that needs to be addressed by researchers is the manner in which school characteristics interact with background variables in order to influence outcomes in students. To put it simply, we need to know what sorts of schools gave what sort of impact on what sort of student.

Beyond that conclusion, our data become somewhat more tentative. The descriptions of school bureaucratization seem to offer an inadequate means of describing differences between schools, at least in terms of the educational aspirations of students. While the concept of bureaucratization may be a useful means of describing differences between schools for other purposes, we hesitate to recommend its continued use as a predictor of aspiration level.

The path analysis indicates that the type of program in which a student is enrolled seems to be the single largest determinant of his aspiration level. Indeed, there is good reason for this, since there can be no clearer indication to a student that he should give up college aspirations than his placement in a

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[7] We are displeased with the analysis for three major (and several minor) reasons: we would like to have had a measure of intelligence, the use of age as a proxy for success is inadequate, and the data do not meet all (of the perhaps unnecessarily rigid) assumptions required for a path analysis.

terminal education program. Among other things, such programs serve a function in lowering the generally high aspiration levels of students.[8]

While the notion of a link between school bureaucratization, alienation and aspiration level is not disproved by the path analysis, neither does it receive strong confirmation. Clearly, there are other, more potent predictors of aspiration level than those perceptual measures, and for the moment at least researchers might more profitably concentrate on more objective and powerful predictors of student outcomes. Our analysis of these data does not lead us to believe that major advances in our understanding of aspiration level will be obtained by extensive pursuit of perceptual measures of school structure.

There is further reason to suppress work on such subjective variables--their meaning is hard to convey to teachers and administrators once a study is completed. Thus, even if these variables had been highly associated with important outcomes in students, we have some reservations about our ability to communicate our findings in ways which would lead to a successful modification of the way in which schools function. The near zero correlation between teacher and student perceptions of school bureaucratization found in the original work with our data (Anderson, 1970) is indicative of this problem.

We do feel that path analysis offers a useful means of getting at the effect of school variables. Since a great deal of research seems to indicate that school effects are relatively trivial, and that they must be interpreted with a great deal of caution (see, for example, Hauser, 1970), we think that path analysis, with its great potential for studying patterns of interaction between variables, might let researchers have a better view of the proportion

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[8]This phenomenon can also be observed in operation in longitudinal data where overall aspiration levels drop over time. (See, for example, the carnegie data used in Haller and Anderson, 1969.)

of variance shared between school variables and variables which describe the background of individual students. It seems that this interaction offers the most promising area for research on the effects of school environments. We will be pleased with this study if it succeeds in triggering some more studies which aim to examine the variance in student outcomes more carefully than has been the case in many of our earlier attempts to explain what happens to children in school.

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